IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: US application Ser No 10/521,804

Inventor: Rozendaal, et al.

Examiner: McGowan, Jamie Louise

GAU: 3671

DECLARATION UNDER 37 CFR 1.132 OF HORST G. BOHNER

I, Horst G. Bohner, being duly warned of the consequences of making willing false statements and the like, do declare and state as follows:

1. My name is Horst G. Bohner, and I reside in Stratford, Ontario, Canada:

2. I am the provincial Soybean Specialist for the Crop Technology Branch of the Ontario Ministry of Agriculture, Food and Rural Affairs, in Stratford, Ontario, a position that I have held since 2001;

3. I hold the degree Honours Bachelor of Science, University of Waterloo, Ontario, Canada, granted in April 1998;

4. In my professional position, I have become aware of the work of Jacobus Rozendaal and the other inventors of the conservation tillage implement that is shown and described in US patent application Ser No 10/521,804 ("the '804 application"), which claims priority, as I am told, to a US provisional patent application Ser No 60/451,666 that was filed on 5 March 2003;

5. I have no pecuniary interest in the subject matter of the '804 application or in Salford Farm Machinery Ltd, which I am told is the assignee of the rights in the '804 application, and I make this declaration freely and of my own free will;

6. I am the author of an attached report entitled "Advancing No-Till Soybean Production" ("the Report"), a report that describes work conducted in the 2003-2005 period;

7. The farm implement described in the Report as the "RTS" (Residue Tillage Specialist) or the "Salford RTS" was provided by the aforesaid Salford Farm Machinery Ltd, as indicated at page 4 of the Report;

8. Although I am not trained in legal matters and particularly in United States patent law, it is my understanding that the RTS implement is the type of device that is described in '804 application, and I direct attention to Figure 1 of the Report, which shows two images of the RTS implement that was tested;

9. Although the Report speaks for itself, and the attachment of the Report hereto allows it to do just that, I particularly direct attention to paragraphs 1 and 3 of the Summary of the Report (at pages 3 and 4, respectively), which point out the advantages of the RTS;

11. In my experience in the field of agriculture, farm implement technology, such as in tillage equipment, is relatively mature and, as a result, advancements are made in increments that may appear small with respect to other industries, but which are significant within the industry;

12. In my opinion, the RTS implement tested provides unexpected and non-obvious advantages over previously known technology for increasing the yield of no-till soybean production in some fields.

13. The Ontario Ministry of Agriculture Food and Rural Affairs does not endorse the use of this or any other technology in either a positive or negative way. The Ontario Ministry of Agriculture Food and Rural Affairs also accepts no liability associated with any claims made about this technology.

14. All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and all statements were made with the knowledge that willful false statements are punishable by fine, imprisonment or both.

Signed at Stratford, Ontario, Canada, this 29 day of February, 2008.

Horst G. Bohner

Witness: John Bancroft

Advancing No-till Soybean Production

(Final Report)

Purpose:

This three year study (2003-05) evaluated the use of minimal (shatter) tillage in no-till soybean production systems. No-till production has been adopted on approximately 50% of Ontario soybean acres. Some growers continue to report lower yields in no-till soybean fields compared to conventionally tilled fields. This problem is more frequently reported on heavier textured soils and during difficult growing seasons.

It has been suggested that a low level of pre-tillage prior to planting may improve the seedbed and increase yields while preserving the environmental and economic benefits of a no-till system. A light amount of tillage, approximately 7.5 cm (3 inches) deep may improve the seedbed by aerating, drying and warming the soil while managing previous crop residue.

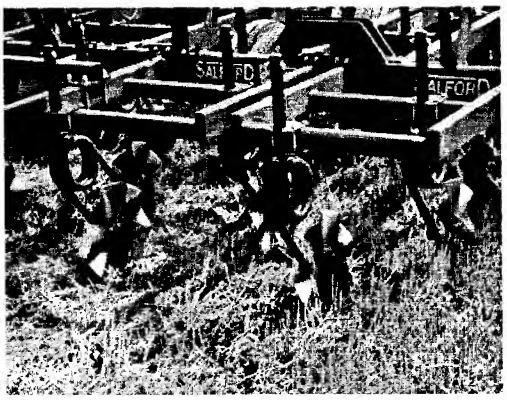
A traditional disc or cultivator is not ideal for this operation since they cannot effectively handle the residue associated with a no-till system and would require several trips to achieve a level seedbed. These field trips are time consuming, costly, and impractical. A newly designed tillage tool called a RTS (Residue Tillage Specialist) was used in this project to evaluate the potential benefits of shatter tillage. The RTS can be operated at a high rate of speed, 18-20 km/h (12 mph) and be effective with a single pass. It also leaves the majority of residue on the soil surface and does not disturb all the soil, thus preserving most of the benefits of a no-till system.

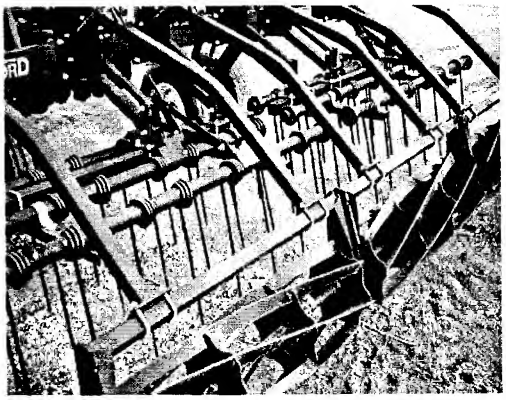
This study also assessed the value of attaching tillage coulters to a John Deere no-till seed drill for soybean planting. John Deere drills are not equipped with standard coulters. Some producers have reported increased yields when attaching a coulter cart to their no-till John Deere drill. Coulters that operated in the seed row were attached to a 1560 John Deere drill and evaluated at two depths during planting.

Methods:

A Salford RTS (Residue Tillage Specialist) was operated a few days prior to soybean planting to prepare a lightly worked seedbed for planting. The Salford RTS is unique in design and function because the coulters are distributed over the whole equipment frame and not in gangs. They also utilize unique individual suspensions called Coil Tech Coulters. This makes it possible to run over rocky ground without damaging the equipment, as well as turning in the field without lifting the implement. The RTS was operated 1-3 days prior to planting at a speed of approximately 18-20 km/h (12 mph). The RTS was equipped with 4.5cm (1¾-inch) wavy coulters at 18cm (7 inch) spacing along with tine and rolling harrows at the rear (Figure #1). The coulters were operated at a depth of approximately 7.5cm (3 inches).

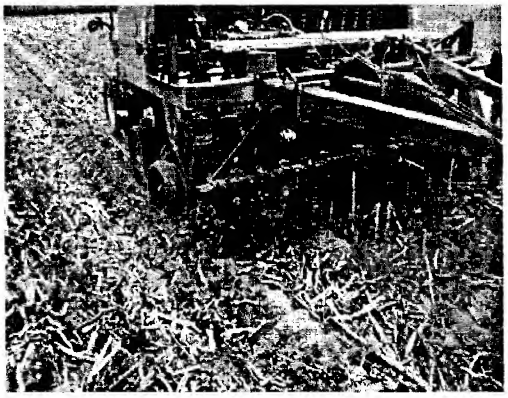
Figure 1. RTS (Residue Tillage Specialist)

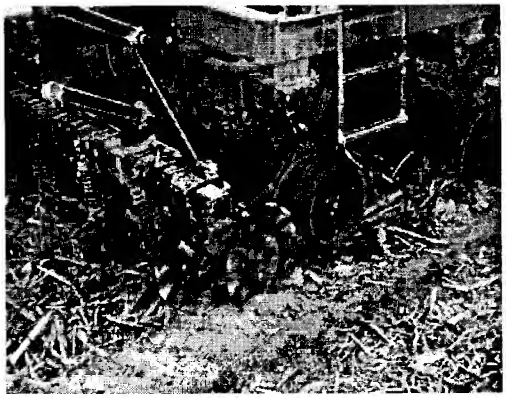




Other treatments in the experiment involved equipping a no-till 1560 John Deere drill with a Yetter coulter cart. One 2cm (¾ inch) wavy coulter was positioned to run in front of each seed row (Figure #2). These coulters were tested at two operating depths: 4cm (1 ½ inches) and 9cm (3 ½ inches).

Figure 2. Yetter Coulter Cart attached to a 1560 John Deere Drill





Treatments evaluated:

1) Standard No-till JD1560 drill (no coulters).
2) Shatter harrow (Salford RTS) operated 1-3 days before planting. No coulters operated on drill.
3) No-till JD1560 drill utilizing in-row tillage (2 cm [¾ inch] coulters) set at planting depth (4 cm [1 ½ inches]).
4) No-till JD1560 drill utilizing in-row tillage (2 cm [¾ inch] coulters) set deeper than planting depth (9 cm [3 ½ inches]).

Over the three year study period, 40 field scale trials, each with two replications, were established in the following counties: Huron, Perth, Waterloo, Wellington, Middlesex, and Lambton. The majority of plots were planted into corn stalks, which is the most common

crop rotation in Ontario. Five were planted into soybean stubble, one trial into mustard and one was planted into winter wheat stubble.

Results:

The following tables present the plant stand and yield data collected from these sites.

Table 1: Tillage System Impacts on Average Soybean Plant Stand. Results from 40 Site Years (2003-2005)

Treatment	Mean plants/ha (plants/ac)**	
No-till	409,675 (165,793)	a
Salford Residue Manager (RTS)	420,091 (170,818)	a
Drill Coulters Shallow (1.5")	416,005 (168,355)	a
Drill Coulters Deep (3.5")	410,964 (166,315)	a

**Values followed by the same letter are not significantly different at the 5% level.

The average population counts across all sites showed no statistical difference in plant stands between treatments. However, at a few sites an increase in plant stands was observed where the RTS was operated and a plant stand decrease resulted from operating the drill mounted coulters at 3.5 inches.

Table 2: Tillage System Impacts on Soybean Yield. Results From 40 Sites Over Three Years (2003-2005)

Treatment	Mean t/ha (bu/ac)**		Advantage kg/ha (bu/ac)
No-till	3.03 (45.1)	c	
Salford Residue Manager (RTS)	3.15 (46.9)	a	2.02 (1.8)
Drill Coulters Shallow (1.5")	3.05 (45.4)	c	0.34 (0.3)
Drill Coulters Deep (3.5")	3.09 (46.0)	b	1.01 (0.9)

**Values followed by the same letter are not significantly different.
Least Significant Difference (P = 0.05) = 0.4
Where the difference between two treatments is more than 0.4 bu/ac there is a less than 1 in 20 chance that it is due to random variation.

Summary:

Operating the RTS 1 to 3 days prior to planting showed a statistical yield advantage of 1.8 bu/ac across all the trials over the three years. This improvement represents a 4.0% yield increase compared to the straight no-till system. This is a sizable yield improvement, considering that previous tillage research conducted in Ontario has only demonstrated a 2 - 5% yield advantage to conventional tillage (fall moldboard plow) compared to a no-till soybean system. Fields ranged in their response to RTS tillage from 0 bu/ac to as high as 4.8 bu/ac.

Operating coulters attached to the John Deere drill deeper than planting (9cm [3 ½ inches]) also resulted in a statistical yield advantage. Coulters operated at this depth resulted in a 0.9 bu/ac advantage over the straight no-till operation. Operating the coulters attached to the

John Deere drill at planting depth did not result in any statistical yield advantage over the straight no-till operation.

The four treatments in this trial can be ranked as follows: The highest yield occurred with the RTS unit run prior to planting, the second highest yield resulted from the deep operation of the drill mounted coulters, while the lowest statistical yield resulted from the straight no-till operation and running the coulters at planting depth. When operating coulters on a John Deere drill, this study would suggest that for maximum yield, coulters must be operated below planting depth. These results run contrary to the notion that coulters should be operated at planting depth on a no-till drill during planting. It should be noted that when running the coulters deeper than planting depth a reduction in plant stand can occur. Nevertheless, this reduction in plant stand did not affect yield, as soybeans are able to compensate for this reduction in stand by plant branching.

The spring of both 2003 and 2004 were relatively wet while the spring of 2005 was extremely dry. Interestingly, tillage treatments responded similarly for all three years. The previous crop did not have a statistically significant impact on the results of the tillage. The treatments behaved in a similar fashion regardless of year or previous crop.

Next Steps:

This study suggests that the 1-3 bu/ac yield difference between conventional tillage and no-till can largely be captured by a single one-pass springtime pre-tillage operation. Further studies will need to be undertaken to verify that the yield benefits of pre-tillage are similar to full conventional tillage, since a fall plow treatment was not part of these large scale trials.

Acknowledgements:

Special thanks to all those who participated in the project:
- The SCIA members that helped conduct the trials,
- The Heartland Regional SCIA which initiated this study,
- Salford Farm Equipment for providing the Salford Residue Manager (RTS),
- Middlesex Soil & Crop Improvement Association for making available their no-till drill,
- Podolinsky Equipment for providing a tractor at a reduced cost.

Project Contacts:

Ontario Soil and Crop Improvement Association 1-800-265-9751
Stay tuned for future results and contact Horst Bohner, OMAFRA (1-519-271-5858) if you wish to be involved in 2006.

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Biography

Horst Bohner has been the provincial Soybean Specialist with the Ontario Ministry of Agriculture Food and Rural Affairs since 2001. He works closely with producers and researchers to address soybean production and marketing issues. His responsibilities include research validation, evaluating production techniques, and providing information to Ontario growers. Horst is past chair of the Ontario Oil and Protein Seed Crop Committee and is the OMAFRA representative for the Heartland Regional Soil and Crop Improvement Association. He is a Certified Crop Advisor.

Previous to working for OMAFRA he conducted field research trials with various crops including corn, soybeans, wheat, canola, tomatoes, apples, and grapes. He was raised and worked on a cash crop farm near Woodstock Ontario so he's familiar with the opportunities and challenges faced by Ontario producers.